

Using Predictive Analytics to Grow Your Construction Business

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They say to be considered an expert in something you must spend 10,000 hours doing it. And having spent most of my career as a contractor, one thing I have personally observed is that successful projects happen because of having such experts on the payroll.

Don't get me wrong; construction is definitely a team effort requiring the contributions of hundreds of different skilled individuals. Making a profit on a job, however, is often due in large part to the knowledgeable superintendent or project manager that has years of "been there, done that" experience.

But in today's construction industry, such seasoned veterans are retiring in record numbers. In addition, hiring a 40-year industry veteran who has likely forgotten more than I'll ever know is very nearly impossible to accomplish for anything less than a king's ransom. On top of this, being a contractor today requires more knowledge and skill beyond just being a star at performing the work itself.

So, how can companies successfully grow their businesses without being limited to the few experts within the company who possess most of a firm's institutional knowledge? I believe success will ultimately require a paradigm shift in what we expect from the people we attract and hire into the ranks of our companies.

Evolving the Expert Experience



Expert individuals tend to work best by managing the flow of a project as they seem to possess an intuitive feel for how a project is doing. In fact, for projects that are not going well, the expert can usually tell something is wrong well before a job cost report or financial statement can be prepared. This is why the success of any construction firm has always been directly attributable to the few experienced individuals that are truly capable of managing the work.

Though the new generation of workers entering the construction industry is much more comfortable with technology, how can such technology-oriented individuals succeed in an industry that is perpetually slow to adopt said technology?

I think the answer is simple. As a company grows and there are fewer experts to support a greater number of projects, the institutional knowledge required to be successful will need to come from new sources. This is not to diminish the importance of the people that know how to build the work. In fact, it's just the opposite.

The right tech tools, woven in and around expert knowledge, will become critical to the success of the modern construction company. This will be accomplished by ensuring that while the experienced project manager may make effective decisions based on "gut feel," the inexperienced project manager will be able to make decisions based on a more analytical approach that leverages reliable data.

Putting Predictive Analytics to Work

How does this happen? What, exactly, can I expect to learn from a computer that I can't learn directly from my 40-year veteran superintendent? The answer will be different for different companies, but it will essentially have to do with leveraging the vast amounts of data in our possession to create meaningful and actionable information.

For example, imagine you are preparing an estimate. With the right technology tools, you can do your takeoff on the concrete footings of a building, input the dimensions, identify the rebar factor and class of concrete, press a button, and be presented with a number that is not only more expedient but more reliable. You can even do things like grab the last few jobs that are most similar and see if your past costs and productivity rates are in line with the predicted cost of the work you are currently estimating.

But double-checking your work takes time, you say, and you've got a lot of work to do, plus you are the one who estimated all those other jobs in the first place, so of course you would expect the numbers to be similar, right? For whatever reason, you felt the estimated cost of this concrete item was important enough to validate, and you made the conscious determination to ask a specific question and research your data to derive a specific answer.

But what about the portions of the estimate you didn't validate, or the questions you didn't think to ask? If your

computer was looking for those types of patterns for you, even when you didn't explicitly ask the question, wouldn't that be helpful? In other words, what if, as I'm estimating that concrete footing, the computer says, "Did you know that in the last five similar jobs you did, this type of concrete footing cost you 35% more than what you are estimating the work at in your current project?"

This is called predictive analytics, also known as machine learning, and it relies on a computer algorithm to identify patterns in your data. Notably, these are specific patterns that may not be apparent or those that we may not have even been looking for because we didn't realize they existed.

The Tech That Surrounds Us

As fantastic as all of this sounds, such predictive technology is already in widespread use in our daily lives. Have you ever gotten into your car to head home, and your navigation system tells you there is a 20-minute delay due to traffic on your route and you may want to consider taking a different route?

You didn't ask the navigation system to look for traffic, but it was watching your patterns and figured out that most days at 5:00 p.m., you get in your car and drive home. It then figured out that today, due to traffic congestion, your route home would take more time than it typically does and predicted you may want to know that information. Imagine being made aware of patterns and trends in your data that you weren't specifically looking for or even thinking about. This is the kind of capability we are talking about.

Leveraging our data in ways that provide us with more actionable information is one of the largest areas for improvement I believe we will see in the coming years. Traditionally, we would tell our information systems what patterns we want to watch for. We define the KPIs that say structural concrete should cost \$200/CY, or we should estimate based on the ratio of 150 lbs./CY of concrete. But there are only so many of those ratios we can manage on our own.

Instead, imagine your newly hired estimator, without the benefit of years of experience to guide them, completing an estimate based on the company's best and most current estimating KPIs, and identifying all the potential areas where,


based on a statistical inference, this estimate may deviate from other past similar projects performed by your company.

Maybe one of those patterns helps determine a design issue, or maybe it just helps find some fat-finger mistakes, or even the misapplication of a particular ratio. With the right predictive analytics tools, a new employee's inexperience can be greatly supplemented by a company's own institutional knowledge already residing in their information systems. And that's a huge win.

A Future Worth Having

It's hard to envision how a new workforce that fundamentally lacks the expert knowledge of having built work for decades will be successful in helping our companies grow and thrive in today's construction market. At the heart of it will be an industry transformation and a willingness to embrace new technologies, ushering in with it a significant change to the way we do business.

The driving force of such a change? It will come from the next generation of tech-savvy managers who will add value in ways that don't rely on gathering hard knock experience alone but can derive a similar "gut feel" for how a project is performing and predict when issues may be starting by leveraging the vast amounts of data being collected by our information systems every day.

Now go sign up for that TikTok account. You know you want to, and who knows? You might just meet the newest generation of experts you never knew existed. 



About the Author

Aaron Cohen is the Estimate Product Director at InEight. He is responsible for defining product requirements and overseeing development of best-in-class estimating software solutions for today's market needs. Aaron has over 15 years of experience in the business as a project manager and estimator for various infrastructure and utility construction projects and teaches courses at Arizona State University on estimating and project controls.

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